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## A CLASSIFICATION OF PHONOLOGICAL PARAPHASIAS\*

§0. The purpose of this contribution is to outline positions argued for elsewhere in German<sup>1</sup> and to give a sketchy interim report of a few results of an ongoing Viennese project on linguistic analysis of aphasia.<sup>2</sup> The data on paraphasias is restricted to German, and is compared with German and English slips of the tongue.<sup>3</sup>

The basic claim is that there cannot be any unitary explanations for phonological paraphasias, because aphasia is neither a disturbance of performance alone nor of language-specific competence and performance only. Instead it is necessary to operate with E. Coseriu's quintuple: faculté de langage (Language universals), language type, langue (- language-specific competence), norme (sociolinguistic norms of realization), parole (- actual performance). This outline will centre on universal aspects of paraphasias (§3), which make German paraphasias so similar to Breton, Italian, Polish paraphasias I have studied myself<sup>4</sup> and to French (see Kilani-Schoch 1982), English, Russian, etc. paraphasias as reported in the literature, and on aphasic disturbances of performance (§7). The underlying phonological model is that of Natural Phonology as developed by D. Stampe (1969; 1979, cf. Donegan & Stampe 1979) and modified by Dressler (1977; 1981; to appear).<sup>5</sup>

§1.0. Since normal slips of the tongue are universally held to be errors of performance, all paraphasias which resemble normal slips can best be classified as disturbances of performance. However, there are significant quantitative (§1.1)



and even qualitative (§1.2) differences, some of which also involve language-specific competence constraints (§1.3) on phonological productions possible in other languages (and thus belonging to the realm of phonological universals). The normal speech-error data comes from Meringer (1908), Meringer & Mayer (1895) for German, from Fromkin (1973) and Garnham et al. (1982) for English.

§1.1.1. Normal speech-errors (slips of the tongue) consist mainly of anticipations, perseverations and matatheses. The first two are either replacements, copying replacements or copying errors (without replacement).

An example of metathesis is Píprikaschnätzel for Ger. Páprikaschnítzel, with a violation of the cross-over constraint (Dressler 1979). English examples for the 6 other types are: anticipatory replacement: [insen] for intense, with anticipation of /s/ replacing /t/ (classified by Garnham, 1982: 809 as substitution); perseveratory replacement: lumber sparty for slumber party (Fromkin 1973: 249 n. 20); anticipatory copying replacement: [ran] corrected to one rouble, with replacement of [w] by [r] (classified by Garnham, 810 as substitution) - it could also be a blend (contamination, see §1.1.3) of [ran] and rouble; perseveratory copying replacement: the one that [ran] for rung, with perseveration of /n/ (classified by Garnham, 809 as substitution); anticipatory copying (without replacement): to [brai] the Irish press for buy (classified by Garnham, 810 as addition).<sup>6</sup>

Such errors in aphasia (all types) are simply more frequent than errors in normal speech - a quantitatively significant, but not important difference.

§ 1.1.2. As very many authors have underlined, normal slips of the tongue neraly always respect position in the syllable and in the foot, e.g. metathesis occurs only between elements in the same syllable position and between two stressed (or, more rarely, two unstressed) elements, as in Píprikaschnätzel (§1.1.1).

This holds to a far lesser degree in all types of aphasia,

e.g. Korporál → [kɔkɔ'ra:l] (anticipatory replacive copying of /l/ from word/syllable-final to word/syllable-initial position), Soldát → [sɔl'da:t], Text [tekst] → [kest], etc., where syllable position is not respected. This is an important quantitative difference.

§1.1.3. Phonological blends (contaminations) occur frequently in normal speech errors, e.g. [glez] from girl + lesbian, immediately corrected to lesbian (Garnham 1982: 813).

Phonological (though not morphological) blends are extremely rare in aphasia other than very mild aphasias - in fact I was unable to detect any in severe aphasias. Many instances reported by Buckingham (1980: 203) should rather be classified in other terms, e.g. his example key, button, spoon, fork → key, cutty, skoon, sfork as perseverations of /k/ and /s/.

This is a very important quantitative difference, which goes with §1.1.4.<sup>7</sup>

§1.1.4. Morphological editing (rescue) often occurs in normal speech errors, i.e. a control mechanism replaces phonologically wrong sequences (due to §1.1.1) with a morpheme of the language.

This happens rarely in aphasia, e.g. in Kapellmeister '(musical) conductor' [ka'pelmaesteɪ] as replaced by [ka'me:lmæstɛ]. First of all, this paraphasia is due to replacive copying anticipation of /m/. But is there, in addition, a paraphasic lengthening and tensing of stressed [ɛ] to [e]? Since Kamel [ka'me:l] 'camel' and Meister 'master' are existing words, Kamelmeister 'camel master' is a possible word of German, although so far a non-existent (morphological!) neologism (or nonce form). Therefore this particular paraphasia may have involved morphological editing.

This is a very important quantitative difference which seems to show (like §1.1.3) that morphology, on the whole, is unable to interfere in the production of phonological paraphasias.<sup>8</sup>

§1.1.5. Successive approximations are often unsuccessful



in all types of aphasia (cf. e.g. Joannette et al 1980). However, in normal speech errors failure to produce the target word correctly (as the consequence of one or more attempts to correct the error) is extremely rare; there is no example in Meringer's (1908) and Meringer & Mayer's (1895) corpus, none in Garnham et al. (1982), and only a handful of instances in Fromkin (1973).

This is a very important quantitative difference which sheds light on the distinction between competence and performance (Keller 1980).

§1.1.6. If we exclude morphological editing (§1.1.4), then the way from the target word to the phonological speech error can nearly always be bridged by a single step or by simultaneous steps. No counterexamples are to be found in Meringer's corpora or Garnham et al. (1982), and only between 4 and 6 in Fromkin (1973), e.g. *hypothesis* replaced by [paʔəds] where the final *-esis* can only be deleted after /s/ has been anticipated into the position after the second vowel. And if we do not allow a simultaneous replacive anticipation of /p - θ - s/ to the position before their respective preceding vowels, then we must assume a successive replacive anticipation of first /p/, then /θ/, then /s/, i.e. multiple successive steps are needed to produce the paraphasia.

This is a very important quantitative difference.

§1.1.7. Substitutions which cannot be classified as either anticipations, perseverations, metatheses (§1.1.1) or blends (§1.1.3) are rare in normal speech errors (cf. §1.1.1. note 6) but frequent in all types of aphasia except in amnesic aphasia (see §3.2).

This is an important quantitative difference.

§1.1.8. Future research involving large-scale statistics will show whether very important quantitative differences (§1.1.3 - 1.1.6 and possibly §1.1.7) are in fact only highly significant quantitative differences between normal speech errors and phonological paraphasias, or whether they represent qualitative differences (§1.2, §1.3, §3), inasmuch as there are only few counterexamples left which can be explained in a

different way.

§1.2. Qualitative differences (cf. also §1.1.8) between normal slips of the tongue and aphasiological errors falsify the view (held at least since Sigmund Freud) that all (phonological) paraphasias are generated by the same mechanisms as normal (phonological) speech errors, and that there is only a quantitative difference in the occurrence of the same error types.

§1.2.1. In very severe aphasias, rarely, phonemes (or quasi-phonemic sounds) may be missing, e.g. /pf/ and [ŋ] in German. This never happens in normal speech.

§1.2.2. Phonological neologisms, i.e. phonological words which do not contain morphemes of the language in question, are typical for jargon aphasia (Buckingham & Kertesz, 1976), but also occur in other types of aphasia.

This is never the case in normal speech errors, i.e. they can always be derived from target forms by means of anticipations, perseverations, metatheses, blends or substitutions.

§1.2.3. Monophonemic affricates can be dissociated (very rarely) in severe aphasias. This is never the case in normal speech errors. E.g. *Peferts* for *Pferd* 'horse' illustrates the dissociation of monophonemic /pf/ into 2 segments /p/ and /f/, with ə-insertion between them. In [ʔəfə] for *Apfel* 'apple', /pf/ is dissociated and then metathesized to /fp/ in its dialectal variant [fə]. Similarly the monophonemic affricate /ts/ is dissociated and metathesized in *Besatzung* 'occupation force' as substituted by [bɪ'zaxstox].

§1.3.1. Another qualitative difference is the following one: (Both deep and surface) phonotactic constraints are nearly always respected in normal speech errors. I know of only three clear counterexamples: 1) Meringer's *stnudiert nicht* for *studiert nicht*, with copying anticipation of /n/: [ʔn] is a prohibited sequence in German.

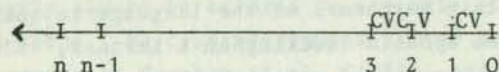
2) Fromkin's (1973) [əskəbəθkənz] for *Athabascans*, with the un-English sequence [θk].

3) [sli:pʃ] for *sleeps* in Garnham et al. (1982: 809), with the un-English sequence [pʃ].



However, in aphasia such violations of (deep and/or surface) phonotactic constraints are much more frequent (Blumstein 1973: 71f. claims that 2.3% and 4.3% of all errors in Broca and Wernicke aphasiacs respectively are of this kind), e.g. word-initial consonant clusters in Ger. [sgæst] for Geist 'ghost, spirit', ['tsʁet|bɐ] for Zwetschge 'plum', [fɛrax] for Fracht 'freight', [dlekɪk] for dreckig 'dirty', [slɪsɪ] for Schlüssel 'key', or in the neologism [ktɐ'lot].

We may think of a very simplified scale of degrees of difficulty in phonotactic combinations, where a CV syllable would be the easiest syllable form, V the next easiest, CVC the third easiest.



On this scale Maori, Samoan, etc. would have a range of 0-2 because these languages have only CV and V syllables, Italian would have a larger range to the left, because it allows up to CCCVC syllables. German would have a still larger range to the left, etc. However, both Italian and German have more easier syllables than difficult ones, e.g. more CV syllables than any other syllable type, and this both in type and token frequency.

Aphasia, I claim, causes two deviations from such language-specific distributions, both of them in the form of relaxations of language-specific regulations of universal phonology:

1) Easier / less marked / more natural phonotactic combinations are preferred, i.e. aphasic production displays a higher frequency of CV syllables (the most natural syllable type) than the corresponding production of normals.

2) Language-specific constraints on the most difficult combinations/syllables allowed in the respective language are relaxed, so that they sometimes produce phonotactic sequences which are allowed in languages which range farther to the left on the (simplified) scale of phonotactic difficulty.

§1.3.2. A similar phenomenon occurs with the phonemic inventory of aphasiacs. On the one hand they prefer (i.e. pro-

duce more often than normals) relatively "unmarked" phonemes of their language (Blumstein 1973). On the other hand they extend (at least in the case of anterior aphasiacs) their sound repertory to more "marked" sounds than are allowed in the phonological system of their language. E.g. in German aphasiacs the un-German sounds [ɸ, θ, ʍ] have been found e.g. in [ɸraeɕ] for Fleisch 'meat'. I.e. the language-specific constraints on the inventory have been relaxed.

This seems never to occur in normal speech errors.

## §2. Disturbances of sociophonological norms

Normal speech is characterized by sociophonological variation between formal and casual, slow and fast speech, between dialectal and sociolectal variants.<sup>9</sup> These norms are rarely violated in speech errors. e.g. the Garnham et al. (1982) corpus contains excessive vowel reduction in [fən] for fantastic (p.809), [səre] for surreptitiously (p.809), and presumably [brɪtʃ] for British (p.809).

However, aphasiacs usually violate sociophonological norms drastically. They cannot vary at all or very little according to the respective formality or informality of the speech situation, they do not change their phonological style whether they speak to a speech therapist for the first time or when they already know her/him very well. Viennese aphasiacs use far more dialect forms than comparable normals, etc.

Unfortunately, as far as I know, sociophonological studies of aphasia have not yet been carried out.

§3.1. Dogil (1981) has found a universal natural tendency towards trochaic rhythm in language typology and child language. This natural tendency is manifested in aphasic speech as well, e.g. (V̇ = primary stress, V̂ = secondary stress)

Spitálschwēster 'hospital nurse' → [[tʰɪp|v̂ɛstɐ],

i.e. V̇ V̇ V̇ V̇ → V̇ V̇ V̇ V̇

Primárius 'chief doctor' → [brɪnɪmá:rɪos].

i.e. V̇ V̇ V̇ → V̇ V̇ V̇ V̇



Zündnadel 'ignition needle' → [tsyntndá:dəl],

i.e.  $\check{V} \check{V} \check{V} \rightarrow V \check{V} \check{V}$

Soldátentüm 'soldierhood' → [sóltəntàntóm],

i.e.  $V \check{V} \check{V} \check{V} \rightarrow \check{V} \check{V} \check{V} \check{V}$  - the alternating iambic

rhythm was replaced with an alternating trochaic rhythm.

Thus we see that a universal natural process can be manifested in aphasia which is neither manifested in the language-specific prosodic system of German nor in normal speech errors.

§3.2. Similarly, I have claimed since Dressler (1974) that a great part of phonological substitutions in aphasia are instances of universal natural processes of segmental phonology.<sup>10</sup>

My modified version of Natural Phonology (see Dressler 1978; to appear; Dressler & Hufgard 1980; Dressler & Wodak 1982) provides a dichotomy of two main types of universal natural phonological processes, backgrounding and foregrounding processes.<sup>11</sup>

Now I claim that the great majority of segmental paraphasic substitutions (which are neither anticipations nor perseverations nor metatheses nor blends, §1.1.7) represent such backgrounding or foregrounding processes which the child must suppress in language acquisition. Their occurrence in aphasic speech represent another instance (cf. §1.3.1, §1.3.2, §3.1) of language-specific constraints being relaxed or uninhibited.

Just a few examples follow:<sup>12</sup>

§3.3.0. Backgrounding processes are most frequent in Broca aphasiacs, less frequent in global aphasiacs, still less frequent in Wernicke aphasiacs, whereas amnesic aphasiacs can be grouped with normals (§1.1.7). We can distinguish the following types:

§3.3.1. Shortening processes are found in ['neb] for ['ne:b(ə)] Nebel 'fog, mist', ['fnebal] for ['fne:bal] Schnee-ball 'snowball'.

§3.3.2. Deletion processes can be found in ['ftip], ['vestə] (§3.1) and in cluster reduction (Wurzel & Böttcher 1979).

§3.3.3. Weakening processes are e.g. vowel centralization as in Universität → ['ənə,be'ðə] (with trochaic rhythm), to-

gether with spirantization of stops in (der) Kinder 'children' → ['xɪndə], cf. Prävision → [frey, 'sio:n], Ball → [βal]. Replacement of oral spirants with laryngeal [h] is most frequent in Broca aphasia, e.g. Schlüssel 'key' ['ʃlys(ə)] → ['hysl].

§3.3.4. Assimilation processes are relatively frequent in Wernicke aphasia. E.g. in German, only the apical nasal can be assimilated to neighbouring obstruents in place of articulation. Not so in the following productions of Wernicke aphasiacs: fängt [fənt] = /fengt/ 'catches' → [fent], fängt Ball 'catches (the) ball' → [fembə] (also with vowel centralization §3.3.3 and consonant deletion §3.3.2), nimmt 'takes' → [nɪnt], gemalt = dialect [gmp:lt] → [gmp:l] (with cluster simplification §3.3.2).

§3.3.5. An extreme case of assimilation processes are fusion processes as in nein 'no' [naen] → [næ̃], gern = dialect and colloquial [gɛən] → [gɛ̃̃].

§3.4.0. Foregrounding processes can be identified in Broca and global aphasia, but virtually never in Wernicke aphasia (see Dressler & Stark 1981), and never at all in amnestics (and normal slips of the tongue). Subtypes are e.g.:

§3.4.1. Lengthening processes (antagonistic to shortening processes §3.3.1) occur in [kɪ:nt], [kɪ:nt] for Kind 'child' [kɪnt].<sup>13</sup>

Aspiration of unaspirated (Austrian colloquial/dialectal) stops has been found by Dressler & Stark (1981) in 28 cases of Broca, 30 of global, 1 (one) of Wernicke aphasia (in a study of 4 patients of each group).

§3.4.2. Vowel insertion (antagonistic to vowel deletion, §3.3.2) occurs in ['tse:bɛra] → ['tse:bra] Zebra, ['mɪlɛx]

['mɪlɪç] Milch 'milk', and in the study of Dressler & Stark (1981) in 22 cases of Broca, 25 of global, 2 of Wernicke aphasia.<sup>14</sup>

§3.4.3. Strengthening processes (antagonistic to weakening processes §3.3.3) can appear as e.g. substitution of fricatives with affricates as in [mu'tsi:k] for Musik 'music' (82 Broca, 69 global, 2 Wernicke in Dressler & Stark 1981).

Substitution of fricatives with stops as in [ə'bestə] for



Schwester ['fvest] 'sister' (notice the inserted vowel, §3.4.2): 44 Broca, 53 global, 10 Wernicke in the study of Dressler & Stark (1981).

§3.4.4. Polarisation processes (antagonistic to fusion processes, §3.3.5) can be exemplified with diphthongization as in [groos] for [gro:s] gross 'great', [ɸaɔɸ] for [bu:p] Bub 'boy', [fɪl'kaɔst] for [li:p'ko:st] liebkost 'caresses', etc.

§3.5.0. Why should foregrounding processes be more frequent in anterior aphasia than in Wernicke aphasia? The sociopsycholinguistic model of phonological variation as developed in Dressler (1978; to appear), Dressler & Hufgard (1980), Wodak & Dressler (1978), Dressler & Wodak (1982) predicts that:

§3.5.1. Foregrounding processes are maximized in slow speech and minimized in fast speech. - Anterior and particularly Broca aphasiacs speak slowly and haltingly, Wernicke aphasiacs do not (fluent aphasia).

§3.5.2. Foregrounding processes are, in general, produced with more articulatory effort than backgrounding processes. - Broca (and anterior) aphasiacs enunciate with excessive articulatory effort.

§3.5.3. Foregrounding processes are maximized in speech situations where much attention is paid to speech (great monitoring, effort for clarity). The reverse holds for backgrounding processes.

Anterior aphasiacs are fairly well aware of their speech, they are often very attentive. Fluent aphasiacs have little awareness of their speech (especially severe cases of Wernicke aphasia with anosognosia), they monitor their speech production rather little.

§3.5.4. Thus this theory can explain the asymmetry in the distribution of many substitution types in anterior vs. posterior aphasia.

§4. Obviously this classification does not cover all cases of phonological paraphasias (cf. §3.2 note 10). However, I dare say that it represents a step forward towards a consistent theory of phonological paraphasias. Furthermore, the distinction between qualitative (or very important quantitative) dif-

ferences between pathological paraphasias and normal speech errors offers the speech therapist a practical tool for assessing progress in the therapy of phonological disturbances in aphasia and for determining when the errors of a patient have stopped being pathological - and this without the necessity of gathering enormous samples of her/his patient's speech (which would be necessary only if the difference between normal speech errors and pathological phonological paraphasias were of an exclusively quantitative nature).

#### Footnotes

\*This is a write-up of a paper given in David Caplan's course at the 1982 Linguistic Institute of the LSA. I thank him, Hugh Buckingham, Mary-Louise Kean, Philipp Luelsdorff and Peter MacNeilage for their comments.

<sup>1</sup>See Dressler 1978; 1980; Dressler & Stark 1981; essentially the same position is exposed in detail by Kilani-Schoch 1982.

<sup>2</sup>Funded by the österreichischer Fonds zur Förderung der wissenschaftlichen Forschung. Transcriptions used here from that project are due to H. Stark.

<sup>3</sup>There will be a much longer version which will provide extensive statistics and profit from paraphasic and normal (slip) data from many other languages. It will also discuss the existing, important literature on phonemic paraphasias (cf. Dressler 1974 for the older literature).

<sup>4</sup>With the help of G.F. Denes and E Magno-Caldognetto for Italian, H. Mierzejewska for Polish. The same patterns occur in the data of three Flemish aphasiacs that Y. Lebrun has kindly sent me.

<sup>5</sup>The model of Natural Phonology was first applied to the study of aphasia by Dressler 1974. For extensive studies, see Wurzel & Böttcher 1979; Kilani-Schoch 1982.

<sup>6</sup>Garnham et al (1982) present no example of addition which is not either anticipatory or perseveratory in nature. As to substitutions, their number is much higher than I would allow for: Of their 21 substitutions among segment errors I classify 8 as anticipations or substitutions, 5 as dubious (blends? influence by context not given? etc.), 8 as prima facie instances of substitutions; but they do not give enough context and they have naturally not been able to ask the speakers what they were thinking when they produced the speech error (as R. Meringer did); thus there may be blends among these errors.



<sup>7</sup>Kilani-Schoch (1982: 461f.) lists a somewhat higher number of blends from her aphasic patient. However, some examples are of a rather doubtful nature; then the target words are more similar to each other than is the case in German and English blends of normals.

<sup>8</sup>Here again, cf. Kilani-Schoch (1982: 461f.)

<sup>9</sup>On the model and methodologies of studying sociophonological variation as developed in Vienna since 1971, see Wodak-Leodolter & Dressler (1978); Dressler & Wodak (1982).

<sup>10</sup>This claim has been enlarged by Wurzel & Böttcher (1979) to the view that all segmental substitutions in aphasia represent universal natural processes in the sense of Stampe (1979). However, performance errors (§1.1.1) do not represent natural phonological processes, nor do intrusions (such as *papra* for *papa*) or other, fairly infrequent errors that seem to be genuine selection errors, such as paradigmatic changes of place of articulation (cf. MacNeilage 1982).

<sup>11</sup>This corresponds roughly to lenition and fortition processes in Stampe (1979); Donegan & Stampe (1979).

<sup>12</sup>Far more in Dressler 1978; Dressler & Stark 1981; Kilani-Schoch (1982). On cluster simplifications, see Wurzel & Böttcher (1979).

<sup>13</sup>Differentiation of phonetic lengthening and hesitation phenomena is difficult.

<sup>14</sup>Instances with anticipatory or perseveratory vowel copying (intrusion) are not included, since they are classified as pure performance errors (§1.1.1).

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(Many more references will be given in a forthcoming, much longer final version of this paper)

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### Zusammenfassung

Dieser Beitrag umreißt Standpunkte, die bereits im Deutschen dargestellt wurden (Fn.1), und berichtet vorläufig über einige Ergebnisse des noch laufenden Wiener Projektes zur linguistischen Analyse der Aphasie. Die Daten über Paraphasien im Deutschen werden mit Daten über Versprecher (slips of the tongue) im Deutschen und Englischen verglichen.

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WIENER  
LINGUISTISCHE  
GAZETTE

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/<sup>1</sup>matto/ ODER /<sup>1</sup>mat:o/? JEDENFALLS [<sup>1</sup>mat:o],

ZUR KONSONANTENLÄNGE IM ITALIENISCHEN.\*

I. Wir nehmen in dieser Arbeit die Diskussion um die Konsonantenlänge im Italienischen wieder auf, weniger um schon gebrachte Argumente zu untermauern oder zu widerlegen, als vielmehr, um neue Evidenz in die Behandlung dieses Themas einzuführen. Die verschiedenen Beiträge zu diesem Thema, das in jeder Arbeit zur Phonologie des Italienischen einen gewissen Raum einnimmt, werden in Muljačić (1972) zusammengefaßt, weshalb hier auf eine nochmalige Darstellung verzichtet wird.

Daß phonetische Quantität phonologische Qualität besitzt, ist ein an sich nicht selten vorkommender Fall. Die Frage, ob phonetische Quantität phonologisch als ebensolche zu repräsentieren ist (monophonematische Lösung) oder als die Aneinanderreihung von zwei gleichen Qualitäten (biphonematische Lösung), legt unseres Erachtens die Beweislast primär auf jene Seite, die für die Phonologie ein Abweichen